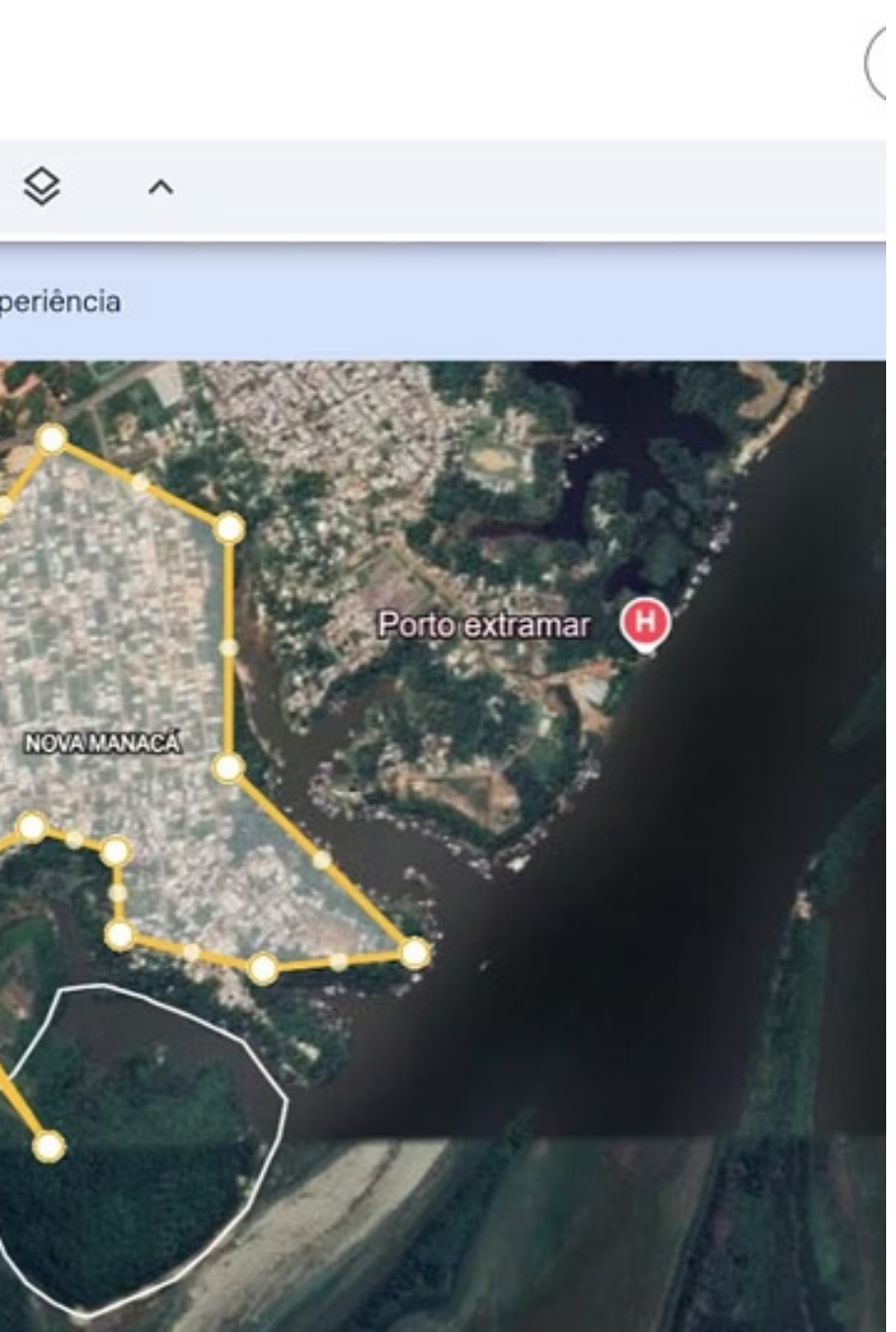
Sol de Manacapuru Solar Project

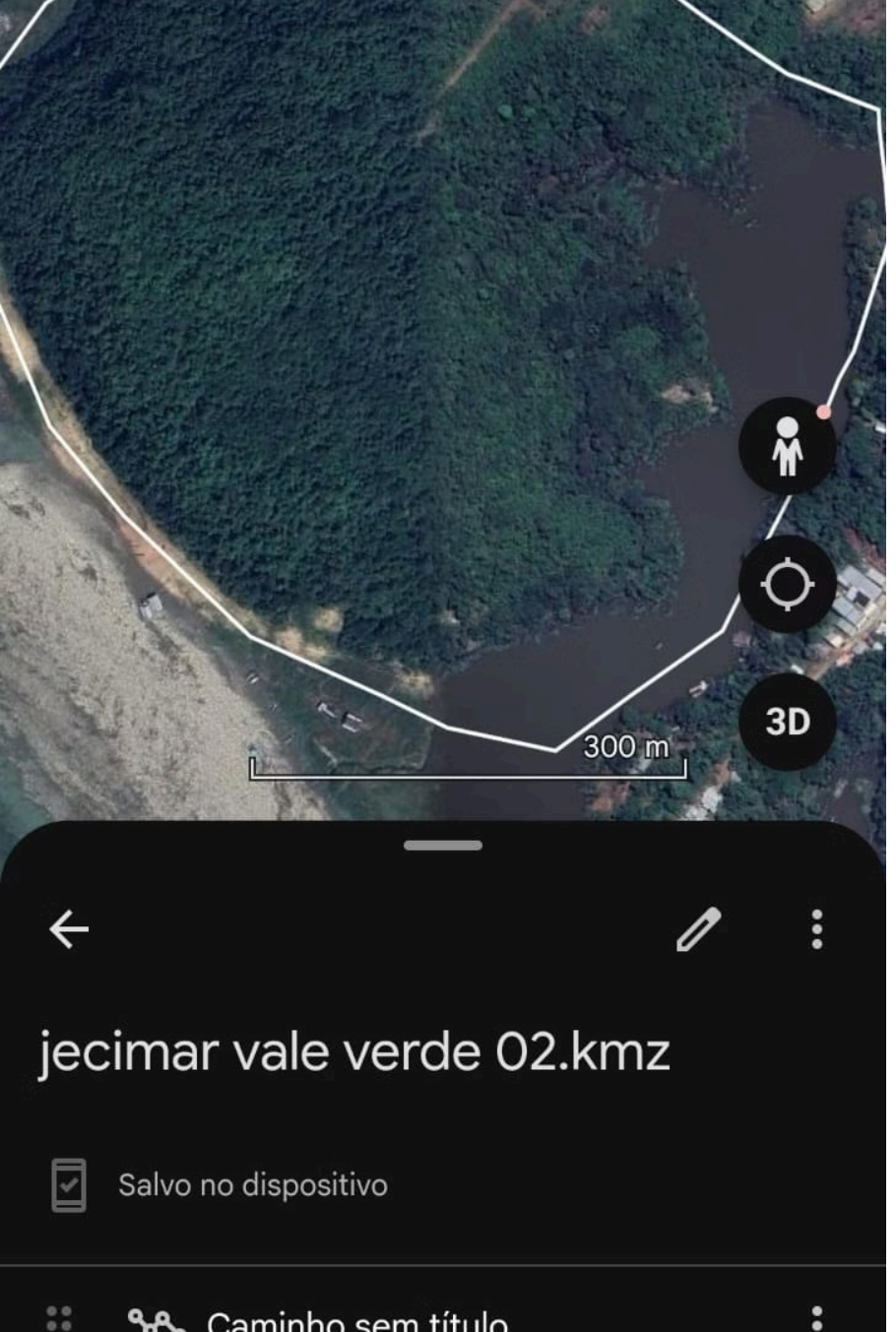
Here is the complete and detailed project plan for "Sol de Manacapuru," translated into English, structured for your Gamma App presentation.



"SOL DE MANACAPURU" SOLAR PROJECT: Detailed Final Proposal

An Integrated Energy Hub for the Brazilian Amazon

This comprehensive proposal outlines our vision for a transformative renewable energy project in the heart of the Amazon region, combining solar power generation with innovative distribution solutions.



Title and Overview

Project Identity

- "Sol de Manacapuru" Solar Project: Leading the Energy Transition in the Amazon
- Clean Energy Generation, Local Supply, and Sustainable Mobility in Manacapuru, Amazonas, Brazil
- Location: Manacapuru, Amazonas State, Brazil

Vision & Parameters

- Vision: To be a benchmark in renewable energy, driving local economic development and quality of life through innovative, 100% renewable energy solutions
- Currency of Analysis: Brazilian Reais (R$)
- Reference Exchange Rate: 1 USD = R$ 5.40 (as of this analysis date)
- Project Lifespan: 25 years

The Core Asset: Land and Solar Potential

Strategic Land Assets

- Project Area: 22 hectares (equivalent to 220,000 m²)
- Strategic Location: Proximity to Manacapuru city, with potential for connection to the existing Amazonas Energias grid and access to local communities, ideal for energy distribution
- Solar Resource: Excellent solar irradiation index in the Amazon region, ensuring high photovoltaic generation efficiency
- Strategic Land Value: The project's development on this property significantly increases its strategic value and potential for future energy uses

Estimated Land Value in Year 25 (project end): **R$ 2,533,487** (nominal value, reflecting a 4% real annual appreciation over an initial base value of R$ 43,200 per hectare)

Advanced Technical Configuration

1

Photovoltaic Capacity

Installed Photovoltaic Capacity (DC): 21.12 MWp (Megawatts peak)

- Component for Grid/Commercial Sale: 19.12 MWp
- Component for Distributed Generation (DG): 2.0 MWp

Cutting-Edge PV Technology:

- Solar Panels: 720 Wp Bifacial Panels (high efficiency, capturing light from both sides)
- Tracking Systems: Single-axis Solar Trackers (optimize daily solar capture by moving the panels)

2

Energy Storage

Energy Storage System (BESS - Li-ion Batteries):

- Capacity: 33.6 MWh (Megawatt-hours)
- Purpose: Ensure stable supply and optimize energy dispatch for the Distributed Generation component, providing backup during non-solar hours
- DG Beneficiaries: Approximately 500 households, ensuring reliable and quality supply

Annual Production Degradation Rate: 0.5% (typical for modern panels)

3

Distribution Infrastructure

Local Distribution Infrastructure (New Own Grid):

- Objective: Directly supply energy to additional neighborhoods, creating an efficient local grid
- Components: Poles, power lines (medium and low voltage), distribution transformers, protection and sectionalizing elements, control panels, and digital meters
- Estimated Dispatch Capacity: Designed to handle up to 5 MWac of peak demand
- Potential Connected Households: Approximately 5,300 additional households

4

EV Charging Network

Electric Vehicle (EV) Charging Points:

- Quantity: 20 units
- Location: Strategically distributed in Manacapuru
- Purpose: Promote electric mobility and generate additional revenue from a premium service

Diversified Energy Sales Strategy

Total Annual PV Production (Year 1): 36,368.6 MWh/year. (This annual production decreases by 0.5% due to degradation, but sales prices increase by 2% real annually)

Distributed Generation (DG) - Direct to End-Users

High Priority

- Volume (Year 1): 6,864 MWh/year
- Sales Price (Year 1): **R$ 810 / MWh** (equivalent to USD 150 / MWh)

Direct Sales to Households (New Own Distribution Grid)

Second Priority

- Volume (Year 1): 17,702.8 MWh/year
- Sales Price (Year 1): **R$ 594 / MWh** (equivalent to USD 110 / MWh)

Energy Sales to EV Charging Points

Third Priority

- Volume (Year 1): 1,095 MWh/year
- Sales Price (Year 1): **R$ 2,160 / MWh** (equivalent to USD 400 / MWh)

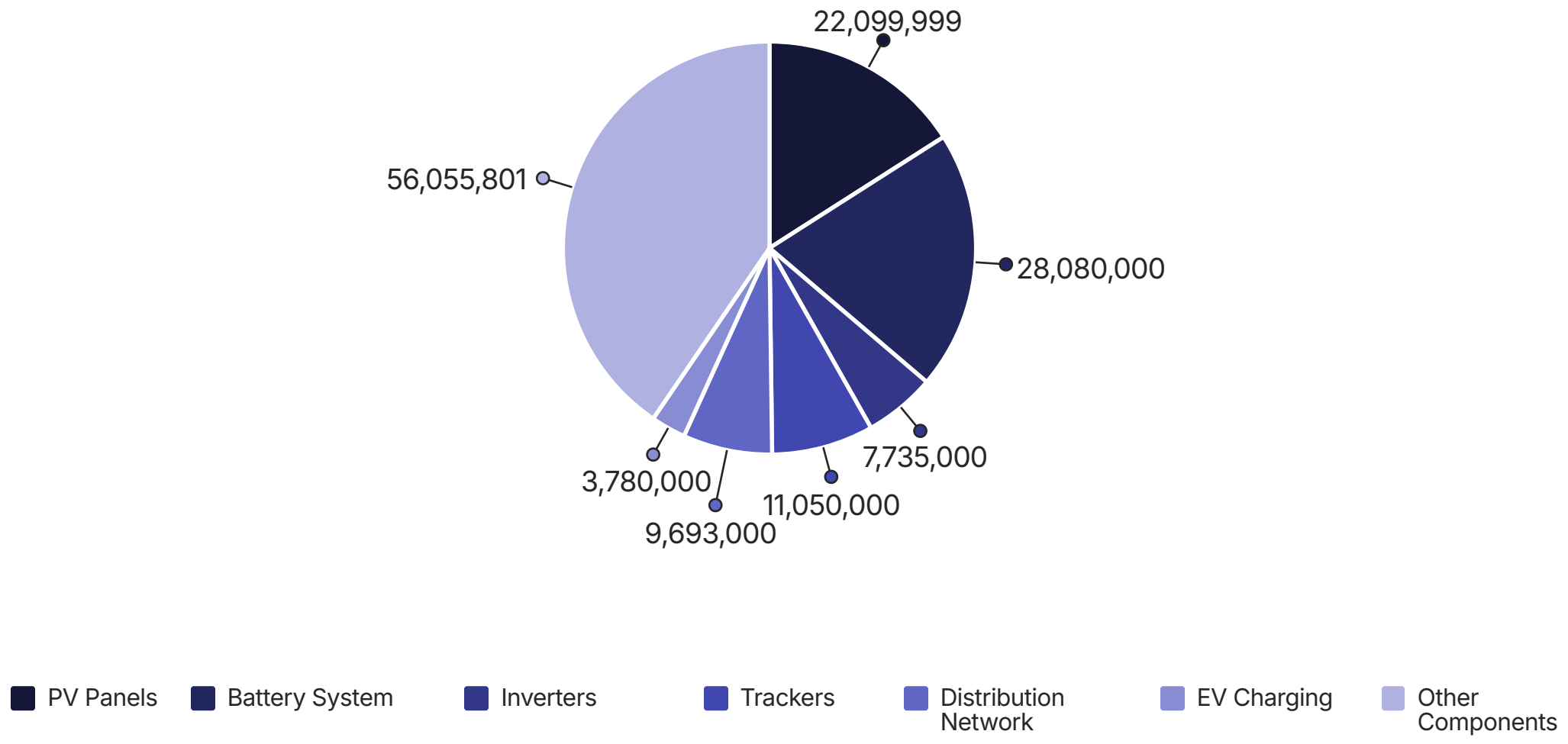
Sales of Surplus Energy to Manaus Energias (to the Grid)

Fourth Priority

- Volume (Year 1): 10,706.8 MWh/year
- Sales Price (Year 1): **R$ 459 / MWh** (equivalent to USD 85 / MWh)
- Injection Limit: Subject to a 10 MW injection limit at the existing connection point with Amazonas Energias

Detailed Investment (CAPEX) Breakdown by Item (in R$)

Total Estimated Project CAPEX (Initial Investment): R$ 138,493,800



Direct PV Plant Costs (21.12 MWp)

- Photovoltaic Panels: R$ 22,099,999
- Inverters: R$ 7,735,000
- Support Structures (Trackers): R$ 11,050,000
- Electrical Balance of System (BOS): R$ 5,525,000
- Civil Works and Site Preparation: R$ 3,315,000
- Step-Up Substation and Main Grid Connection: R$ 2,210,000
- Perimeter Fencing: R$ 324,000
- Security Systems (CCTV, Access Control): R$ 1,193,400

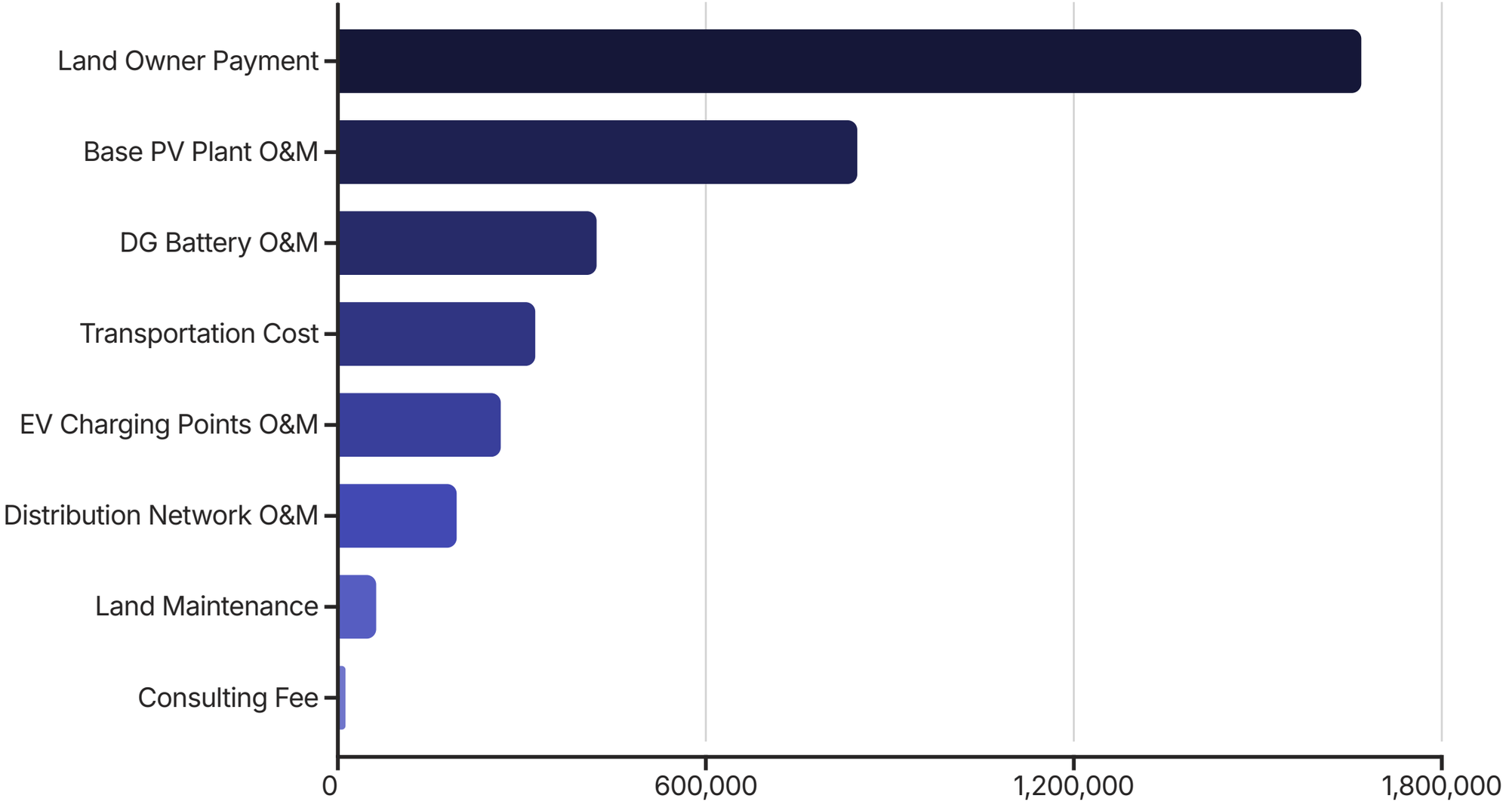
Other Major Components

- Battery Energy Storage System (33.6 MWh): R$ 28,080,000
- Distribution Infrastructure: R$ 5,400,000
- Digital Meters (for end-users): R$ 4,293,000
- EV Charging Equipment (20 Points): R$ 3,780,000
- Engineering and Project Management: R$ 2,596,750
- Government Permits and Licenses: R$ 519,350
- Fixed Consulting Fee: R$ 540,000
- Contingency (5%): R$ 2,963,530

Detailed Annual Operating Costs (OPEX) Breakdown

Total Estimated Annual OPEX (Year 1): R$ 3,795,476

(Fixed OPEX items will be adjusted annually by a 4% inflation rate)



The chart above shows the detailed breakdown of annual operating costs for the "Sol de Manacapuru" project in Year 1. The largest expense is the Land Owner Payment, which represents 10% of Total Gross PV Plant Revenue, followed by the Base PV Plant Operations & Maintenance costs. The DG Battery O&M and Transportation Cost (TUSD/TUST - for sales to Manaus Energias) are also significant expenses.

Key Financial Projections and Profitability

R$...	R$...	R$ 19.56M	9-10...
Annual Gross Revenues (Year 1)	**EBIT (Year 1)**	**EBITA (Year 1)**	**Simple Payback Period**
Revenues grow annually by 2% real due to price escalation, adjusted for 0.5% degradation	Earnings Before Interest and Taxes - indicates operational profitability before financing costs and taxes	Earnings Before Interest, Taxes, and Amortization - represents gross operational cash flow, a strong indicator of cash generation capability	The initial capital is recovered in less than half of the project's lifespan

NPV (Net Present Value - at 10% WACC)

Definition: Present value of all future net cash flows, discounted at a 10% Weighted Average Cost of Capital (WACC)

Projected Value: R$ 172,800,000 - R$ 259,200,000

A massively positive NPV indicates that the project creates substantial wealth for investors, far exceeding the cost of capital

IRR (Internal Rate of Return)

Definition: The annualized profitability the project is expected to generate

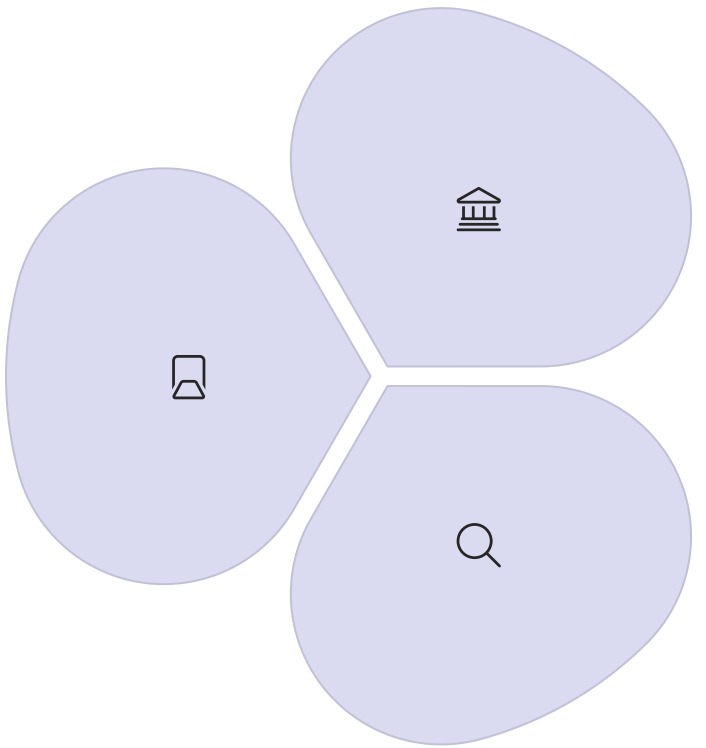
Projected Value: 23% - 29%

An exceptionally high IRR, significantly above the 10% WACC, validates the project's robust financial attractiveness

Detailed Benefits for Key Stakeholders

Project Investor(s)

- Outstanding Profitability: The project offers a highly attractive Return on Investment (ROI), with an NPV and IRR that position it as a top-tier investment in the renewable energy sector
- Diversified Revenue Streams: Reduces financial risk by not relying on a single sales channel
- Positive Impact: Investment in clean energy and local development aligns with global sustainability goals



Land Owner

- Sustainable Passive Income: Receives annual lease payments, estimated to accumulate to approximately **R$ 40,068,000** over 25 years (non-discounted value, growing annually due to energy price escalation)
- Land Appreciation: The property gains significant strategic value by hosting a major energy infrastructure project

Consultancy

- Fixed Initial Fee: R$ 540,000
- Variable Commission: Approximately **R$ 253,800** accumulated over 25 years (non-discounted value, based on 0.05% of total annual gross project revenues)

Advanced Financial Structuring and Optimization

Objective: To further enhance investor returns and secure competitive financing terms.

Capital Mix Optimization

Explore a **Debt-to-Equity ratio of 60%-80% debt**, leveraging the lower cost of debt and tax deductibility of interest to reduce the project's WACC.

Debt Financing Sources in Brazil

- **BNDES (National Bank for Economic and Social Development):** A key player, offering long-term credit lines with competitive rates (e.g., FINEM)
- **Commercial and Development Banks:** Access to project finance from major Brazilian and international banks
- **Regional Development Banks:** Such as Banco da Amazônia (BASA) for specific regional projects

Green Finance Instruments

The project's clean energy nature qualifies it for:

- **Green Bonds:** Issuance of debt in the capital markets specifically for sustainable projects, attracting ESG investors
- **Green Loans:** Specialized credit lines from financial institutions

Favorable Tax Incentives in Brazil

- **REIDI:** Reduces CAPEX by suspending PIS/COFINS on goods and services acquired for project implementation
- **Accelerated Depreciation:** Improves early cash flow by allowing faster depreciation of assets for tax purposes
- **ICMS Exemptions:** Potential state-level tax benefits on equipment or generated energy (to be confirmed with Amazonas State legislation)
- **Incentivized Debentures:** Attracts investors by offering tax-exempt returns, potentially lowering the cost of debt

Viability Analysis and Project Conclusion

Viability Analysis

Strengths

- **Exceptional Financial Profitability** (high NPV and IRR)
- Innovative and Diversified Business Model (grid sales, DG, EV charging)
- Growing Revenues Annually
- Strategic Market Position
- High Social and Environmental Impact

Challenges to Manage

- Regulatory complexity for operating a private distribution network
- Operational complexity of multiple channels
- Need for accurate local demand validation

These challenges are manageable with diligent planning and execution.

Final Conclusion

The "Sol de Manacapuru" project is an **extraordinarily lucrative and transformative investment opportunity** in the Brazilian Amazon. It combines large-scale renewable energy generation with innovative distribution and electric mobility solutions. Its robust financial metrics (NPV, IRR, Payback) firmly position it as a highly attractive project, capable of generating significant returns and contributing fundamentally to the region's sustainable energy future.

Critical Next Steps

1. **Detailed Feasibility Study (FEED):** For precise engineering designs and firm quotes
2. **Exhaustive Regulatory Analysis:** Confirm requirements for private distribution network operation and EV charging licenses
3. **Advanced Financial Structuring:** Finalize the financing plan and secure capital commitments

Environmental Impact and Sustainability

Carbon Emissions Reduction

The Sol de Manacapuru project will significantly reduce carbon emissions by replacing fossil fuel-based electricity generation with clean solar power. This contributes directly to Brazil's climate commitments and global sustainability goals.

Estimated annual CO_2 emissions avoided: 18,000 tonnes

Land Use Optimization

The project makes efficient use of land resources by implementing advanced bifacial panels with tracking systems, maximizing energy generation per square meter while minimizing environmental footprint.

The 22-hectare site will be managed with biodiversity considerations, including native vegetation buffers and wildlife corridors.

Water Conservation

Unlike conventional power plants, the solar facility requires minimal water for operation. Panel cleaning will be optimized to use rainwater collection systems, further reducing environmental impact in this water-rich but sensitive Amazon region.

Community Benefits and Social Impact

Local Employment and Skills Development

- Creation of approximately 120 jobs during construction phase
- 25-30 permanent positions for operation and maintenance
- Training programs for local residents in renewable energy technologies
- Partnership with local technical schools for apprenticeship opportunities

Energy Access and Reliability

- Improved electricity access for approximately 5,800 households
- Enhanced grid stability and reduced power outages
- Lower energy costs compared to diesel generation alternatives

Community Development Initiatives

- Educational programs on renewable energy and sustainability
- Support for local entrepreneurship in clean energy services
- Community engagement in project planning and implementation

Risk Assessment and Mitigation Strategies

1

Regulatory Risks

Potential Risks:

- Changes in energy sector regulations affecting private distribution networks
- Modifications to renewable energy incentives or tariff structures
- Delays in obtaining necessary permits and licenses

Mitigation Strategies:

- Comprehensive regulatory due diligence before financial close
- Engagement with regulatory authorities early in the process
- Flexible business model that can adapt to regulatory changes
- Contractual protections for major regulatory shifts

2

Technical Risks

Potential Risks:

- Equipment performance below specifications
- Grid connection challenges
- Battery storage system reliability issues

Mitigation Strategies:

- Selection of tier-1 equipment suppliers with proven track records
- Comprehensive testing and commissioning protocols
- Robust O&M contracts with performance guarantees
- Redundancy in critical systems

3

Market Risks

Potential Risks:

- Lower than projected energy demand
- Payment defaults from local customers
- Competition from other energy sources

Mitigation Strategies:

- Thorough market research and demand validation
- Diversified revenue streams across multiple channels
- Prepaid metering systems for residential customers
- Competitive pricing strategy

Implementation Timeline and Milestones

1

Q1-Q2 2024: Project Development

- Detailed engineering design completion
- Environmental impact assessment and permitting
- Finalization of financial structure and investor commitments
- Land acquisition and site preparation planning

2

Q3-Q4 2024: Pre-Construction

- Equipment procurement and contracting
- Site preparation and civil works commencement
- Community engagement programs launch
- Grid connection agreements finalization

3

Q1-Q3 2025: Construction Phase

- Installation of mounting structures and solar panels
- Battery storage system deployment
- Local distribution network construction
- EV charging infrastructure installation

4

Q4 2025: Commissioning

- System testing and grid synchronization
- Performance verification
- Staff training and handover
- Commercial operation date (COD)

Technology Selection and Innovation

Advanced Solar Technology

The Sol de Manacapuru project incorporates cutting-edge solar technology to maximize efficiency and durability in the challenging Amazon climate:

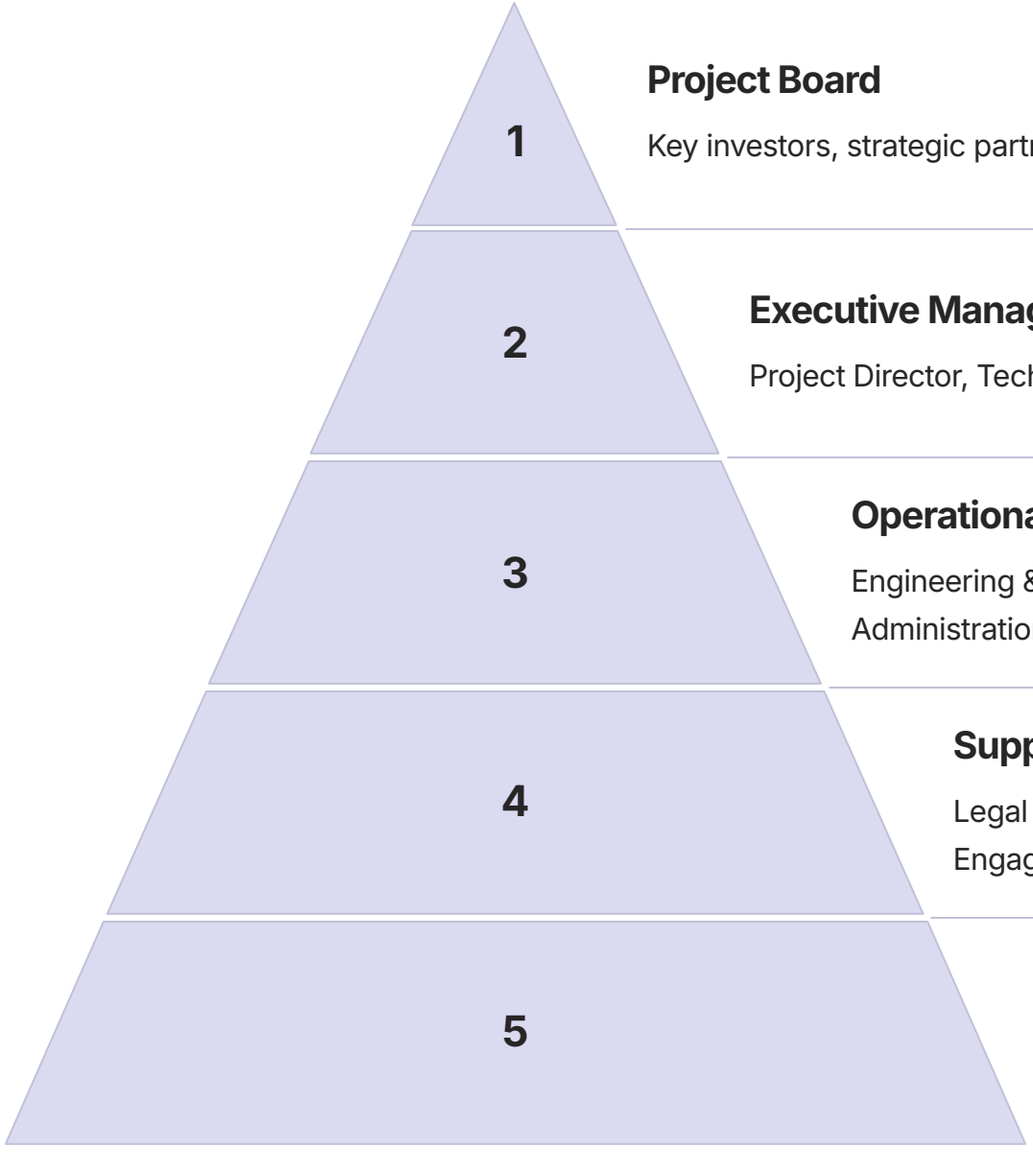
- **Bifacial Panels:** 720 Wp high-efficiency modules that capture light from both sides, increasing energy yield by 5-30% compared to traditional panels
- **Single-Axis Tracking:** Mechanical systems that follow the sun's path throughout the day, improving generation by up to 25% compared to fixed installations
- **Anti-Soiling Coatings:** Special treatments that reduce dust accumulation and minimize cleaning requirements in the humid Amazon environment
- **Enhanced Weather Resistance:** Panels and components designed to withstand high humidity, heavy rainfall, and tropical conditions

Battery Storage Innovation

The 33.6 MWh battery energy storage system features:

- **Advanced Lithium-Ion Chemistry:** Optimized for tropical climate conditions with enhanced thermal management
- **Smart Battery Management System:** AI-powered software that optimizes charging/discharging cycles to extend battery life and improve efficiency
- **Modular Design:** Scalable architecture allowing for future capacity expansion as demand grows
- **Second-Life Strategy:** Plan for repurposing batteries for stationary applications after their primary lifecycle ends

Governance and Project Management Structure



Project Board

Key investors, strategic partners, and senior advisors

Executive Management Team

Project Director, Technical Director, Financial Director, Community Relations Director

Operational Teams

Engineering & Construction, Grid Operations, Customer Service, Maintenance, Administration

Support Functions

Legal & Regulatory Compliance, Environmental Management, Community Engagement, Financial Control, HR & Training

External Partners

Equipment Suppliers, Construction Contractors, Technical Consultants, Financial Institutions, Government Agencies, Community Organizations

The governance structure ensures clear accountability, efficient decision-making, and effective stakeholder engagement throughout the project lifecycle. Regular reporting mechanisms and performance reviews will maintain transparency and enable continuous improvement.

Scalability and Future Expansion Potential

Phase 1: Core Project (Current Proposal)

Implementation of the 21.12 MWp solar plant with battery storage, local distribution network, and initial EV charging infrastructure as detailed in this proposal.

Phase 2: Capacity Expansion

Potential to increase solar generation capacity by an additional 10-15 MWp on adjacent land, expanding the customer base and energy sales volume.

Phase 3: Technology Integration

Incorporation of complementary technologies such as green hydrogen production, advanced microgrids, and smart city applications to create a comprehensive clean energy ecosystem.

Phase 4: Regional Replication

Leveraging experience and economies of scale to develop similar integrated energy hubs in other Amazonian communities, creating a network of sustainable energy centers.

The modular design of the Sol de Manacapuru project allows for phased expansion without disrupting existing operations. Each phase builds upon the infrastructure and capabilities established in previous stages, creating a pathway for sustainable growth and increasing returns on investment.

Conclusion: A Transformative Opportunity

The Sol de Manacapuru project represents a rare convergence of exceptional financial returns and profound positive impact. With projected IRR of 23-29% and NPV of R$172-259 million, it stands as an extraordinarily attractive investment opportunity in the renewable energy sector.

Beyond the compelling financial metrics, this project will:

- Transform energy access for thousands of Amazonian households
- Create sustainable local employment and economic development
- Demonstrate innovative clean energy solutions for remote communities
- Contribute to Brazil's climate commitments and sustainable development goals

The comprehensive approach—combining generation, storage, distribution, and electric mobility—creates a resilient business model with diversified revenue streams and significant growth potential.

We invite forward-thinking investors and partners to join us in bringing this transformative vision to reality. The Sol de Manacapuru project offers not just exceptional returns, but the opportunity to lead the clean energy transition in one of the world's most important ecological regions.

Together, we can create a sustainable energy future for the Amazon while generating outstanding value for all stakeholders involved.